

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554**

In the Matter of)	
)	
Redesignation of the 17.7-19.7 GHz)	IB Docket No. 98-172
Frequency Band, Blanket Licensing)	RM-9005
of Satellite Earth Stations in the)	RM-9118
17.7-20.2 GHz and 27.5-30.0 GHz)	
Frequency Bands, and the Allocation)	
of Additional Spectrum for the)	
Broadcast Satellite Service)	

COMMENTS OF VISIONSTAR, INC.

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A. GENERAL. VisionStar Inc. hereby submits these Comments in response to the Commission's referenced Ka Band NPRM. VisionStar recognizes the complexity of the issues confronting the Commission and the industry concerning band segmentation, sharing and related technical characteristics. VisionStar is a Commission licensee for the Ka Band FSS and is expeditiously proceeding with the construction of its space system, to be located at 113 degrees west. Consistent with public policy, VisionStar does endorse spectrum allocations which encourage maximum spectrum efficiency with spectrum sharing between all potential licensees/operators whenever possible.

The VisionStar space system is envisioned, primarily, to provide a "backbone" satellite service" to the terrestrial broadband wireless service as well as terrestrial hard-wired broadband operators. In this role, VisionStar's space system will interconnect the hubs of terrestrial broadband wireless systems and other terrestrial systems, provide special services, such as BSS and Internet and, via a related satellite subscriber network, connect urban-suburban subscribers to associated subscribers beyond the reach of terrestrial systems. VisionStar thus provides economical network connectivity to terrestrial networks. The VisionStar backbone system is specifically designed to efficiently serve terrestrial networks. VisionStar also will develop a "stand-alone" subscriber network, served only by satellite.

VisionStar's premier service to broadband wireless hubs can function in allocations having FSS and FS co-primary or primary-secondary allocations. However, when VisionStar locates its' "trunking" earth station in the midst of broadband wireless networks in urban areas, VisionStar may cause interference with these wireless networks. In the spirit of maximizing bandwidth efficiency, VisionStar will try to coordinate these occurrences in order to accommodate its' potential customers needs while preserving the FCC's Ka Downlink Proposed Band Plans' integrity. Moreover, the commission may want to revisit the Ka Uplink Band Plan to maximize spectrum efficiency. In short, the primary /co-primary and secondary allocations should be consistent in both Ka Uplink and Downlink Band Plans.

Consequently, VisionStar believes that the public interest is best served if the FSS and FS operate in separate bands, each with primary designations, which VisionStar understands to be the heart of the Commission's segmentation plan for the Ka Band. However, secondary status should be afforded to all non-primary licensees in both Ka Uplink and Downlink Band Plans.

Thus, VisionStar is interested, via this proceeding, in promoting the interests of the Ka Band FSS while recognizing the value and business potential of the FS. Therefore, VisionStar fully supports the Commission balanced approach to Ka Band segmentation. These "comments", pertaining to VisionStar's Ka Band satellite are submitted in response to the FCC's Ka Band NPRM.

Heretofore, the FCC and its industrial committees, specifically JWG-18, have concluded that the blanket licensing of millions of FSS earth stations and FS terminals is incompatible with co-equal designations of FSS and FS in the Ka Band allocations and that band segmentation of FSS and FS allocations, with primary designations, maximizes the early development and

full performance of each of these services. Both services offer low cost “last mile” subscriber service and band segmentation will enable both the FSS and FS to serve their customers where they find them.

In addition, FSS secondary to a primary FS and vice versa, may not appear to serve the needs of either service since the so-called ubiquity of the primary service can cause substantial hardships to the secondary service. However, VisionStar does perceive uses for a secondary allocation under the discretion and sole risk of the licensee/operator in the secondary status. The secondary designation, by further exploitation of spectral resource, enhances spectrum efficiency, particularly in these more remote regions. A more important advantage might be derived by satellite operators and the public, if there is a temporary secondary designation to FS in the GSO-FSS bands, enabling an early Ka Band service. This proposed allocation is discussed subsequently. Finally, a secondary MSS allocation in the GSO-FSS bands also will serve the public interest since GSO-FSS broadband multimedia systems are capable of providing broadband services to mobile antennas such as 0.5 meter phased arrays.

VisionStar does see increased opportunities for immediate broadband service in suggested changes to the Commission’s proposed Ka Band Plan which are discussed in the following paragraphs.

Finally, VisionStar encourages the Commission to proceed with its proposed expansion of the BSS in the 17/25 GHz band. BSS is a vital part of the multimedia service for both FSS and FS systems. VisionStar enthusiastically endorses the general plan contained in the Commission’s NPRM and offers suggestions and recommendations contained in the subsequent paragraphs in the hope of expediting these proceedings and in enhancing the performance and efficacy of Ka Band FSS, BSS and FS systems.

B. COMMISSION KA BAND ALLOCATION PLAN, PARAGRAPHS 34 TO 41, PRIMARY ALLOCATIONS.

B1. GENERAL. VisionStar encourages the Commission to carefully consider allocations where FSS & FS are co-primary where the basic services require ubiquity. The JWG-18 has been unable to meet the needs of both services with co-equal designations in the same band when both services require ubiquity and where the FSS requires blanket licensing and ubiquity.

The circumstances of the success of sharing in the C Band between FSS and FS was achieved where the terrestrial service principally was long-haul microwave and the satellite service consisted of trunking earth stations in rural or protected areas and narrow band, thin route earth stations. Both successfully used the band but both were thwarted in certain areas.

B2. FSS PRIMARY ALLOCATIONS. The Commission proposes to allocate 250 MHz to GSO FSS on a primary basis in the 18.3-18.55 GHz band complementing the FCC proposed allocation of 250 MHz on a primary basis to GSO FSS in the 28.35 -28.6 GHz band. These allocations, including the primary allocation to GSO FSS in the 29.5-30 and

19.7-20.2 GHz bands, result in a total of 750 MHz for uplink and 750 MHz for downlink transmissions. These primary allocations enable blanket licensing of FSS earth stations in these bands and ubiquitous service. This represents a limited but adequate allocation for first generation GSO FSS. Additional bandwidth is available via an increase in the number of satellite antenna beams, the use of orthogonal polarizations, the use of additional shared allocations within the Ka Band and use of the V/Q Bands.

Adequate primary allocation to GSO FSS enables ubiquitous, last mile satellite service to subscribers anywhere in the U.S. regardless of population density or the nature of the local terrain. All subscribers get the same performance at the same cost. Only satellites enable truly national networks in urban, suburban, rural and remote areas. This is why VisionStar sees an important role for Ka Band FSS in terrestrial broadband wireless networks. VisionStar's satellite service extends the service to subscribers located in areas not likely to be serviceable by broadband wireless systems or hard wired broadband systems. Also, as the Commission is aware, satellites are very efficient in the distribution of signals such as TV and data multicast, over wide areas and in distributing Internet service provider signals.

B3. FS PRIMARY ALLOCATIONS. The Commission proposes to allocate the bands 27.5-28.35 GHz and 17.7-18.3 GHz as primary to LMDS and FS, respectively. VisionStar notes that this allocation amounts to a total of 1.45 GHz compared to 1.5 GHz (750/750 MHz) allocated to GSO FSS on a primary basis. VisionStar, consequently, considers the Commission's proposals balanced with regard to GSO FSS and FS if the proposals incorporated herein are adopted. The increased flexibility sought in these comments benefit both terrestrial and satellite service providers terrestrial wireless service. VisionStar urges the FCC to be consistent in its grandfathering status to existing terrestrial fixed services operations in both Ka Band Uplink and Downlink bands.

B4. FS SECONDARY ALLOCATIONS. VisionStar believes that a secondary allocation to FS in the bands assigned to GSO-FSS systems may have substantial benefits to the satellite systems operating in these bands. VisionStar believes that satellite operators who qualify as a small business may be interested in providing an "Early Service" to their subscribers, before the Ka Band space systems are launched and operating. This allocation enables subscribers to be provided with near term multimedia services using temporary Ka Band terrestrial links. The subscriber terminals, in fact, could be Ka Band earth stations, at the correct frequency, power levels, etc. and with terminal equipment in final form but pointed to Ka Band terrestrial hubs. These terminals would be located in urban and suburban areas since the route length would be small and a number of subscribers are needed to defray the cost of the temporary hub. When the Ka Band satellites are operational, the terminal is merely re-pointed to the satellite, and service thereby economically transferred to the satellite system. No modifications, or little modification, may be required. Since the designation for the terrestrial operation is temporarily secondary, these wireless links, having no status relative to the primary service, must eventually be totally abandoned. Thus, this temporary secondary allocation serves the public interest at no detriment to GSO-FSS satellite operators. The commission would foster vigorous competition by offering this authority only to GSO-FSS Licensees who are qualified small businesses as defined by the SBA as described

in the NPRM Appendix B Section C. The public interest in with this temporary allocation is served by bringing new innovative broadband services faster and more economically while giving the small companies a platform to be competitive and implement service sooner.

B5. FSS SECONDARY ALLOCATIONS. VisionStar suggests that there is value to a secondary allocation to FSS in an FS primary band and vice a versa . While blanket licensing and ubiquity cannot be achieved, satellite services still can be provided to subscribers located in remote areas, or in areas with difficult terrain, where there is no expectation of a wireless system. In the event that the unforeseen happens and interference to or from the primary service occurs, then the earth station operating frequencies might be changed to a GSO-FSS primary band. This secondary FSS operation will improve the spectrum utilization of these bands since wireless systems are not expected to penetrate these areas.

B6. MSS SECONDARY ALLOCATIONS. There is no allocation for broadband multimedia mobile services in the Ka Band. Recognizing that 0.5 to 0.7 meter phased array antennas (and possibly mechanically steered antennas) are feasible in this band, with sidelobe performance comparable to fixed, parabolic antennas of the same size, it is possible to provide a broadband mobile service in the GSO-FSS primary allocations. There are important applications for broadband mobile services to vans and small and large trucks, trains and buses, boats of all sizes, both commercial and private and to commercial airlines and business aircraft. Particular applications may involve ambulances and paramedics in rural areas, mobile news van services and important applications in disaster management, law enforcement, firefighting in remote areas, military logistics and tactical control, etc. It may be possible to provide broadband service to laptop computers under special circumstances.

With a secondary allocation and the Commission's type-qualification process and Ka Band service rules, as discussed herein, coordination with potentially affected satellite operators is assured. A further precaution may be to prevent transmission from a mobile terminal unless it is receiving a unique signal, above a certain threshold, from its designated satellite.

C. COMMISSION KA BAND ALLOCATION PLAN, PARAGRAPHS 34 TO 41, CO-PRIMARY ALLOCATIONS.

C1. GENERAL. The Ka Band Plan also allocates co-primary allocations between the MSS-FL and GSO FSS and FS. These co-primary allocations work only because the MSS-FL service is expected to involve only a few Ka Band gateway earth stations with large antennas, located outside urban areas or in well shielded areas. In addition, the GSO-FSS in this band would be limited to large gateway or similar earth stations. Under these circumstances, the FS blanket licensing would be largely successful and widespread use of these bands by FS can be anticipated. However, VisionStar believes that GSO FSS with blanket licensing and ubiquity also may be implemented as an effective service in these bands. This suggests that the 29.1-29.5/19.3-19.7 GHz bands be modified by the Commission with secondary status to all non-primary licensees.

C2. GSO FSS CO-PRIMARY ALLOCATIONS. VisionStar proposes that the GSO-FSS and MSS-FL use of the 29.25-29.5 GHz band remain co-primary, making this band, as intended, suitable for the limited deployment of gateway and trunking earth stations. In addition, this band may be designated to GSO-FSS on a secondary basis, meaning that GSO-FSS operators desiring to provide ubiquitous service in this band via blanket licensed terminals would resort to satellite and/or frequency diversity in order to avoid interference to the primary services. Again, secondary status would be afforded to the non-primary licensees in order to maintain maximum spectral flexibility and efficiency.

C3 FS CO-PRIMARY ALLOCATIONS. VisionStar proposes to leave the 29.1-29.25 GHz Band as is but to secondary status to the non-primary licensee.

D. FSS SECONDARY ALLOCATIONS. VisionStar notes that multiple NGSO systems operating in the 28.6-29.1/18.8-19.3 GHz band must use satellite diversity in order to minimize intra-system interference. This requires, among other things, a dynamic operation in which each earth station must be aware of the up-to-date ephemeris of all operating constellations and must have instructions for pointing to the succeeding satellite. Thus it is apparent that NGSO systems, on a secondary designation, can operate in a GSO-FSS primary allocation using either satellite diversity and/or frequency diversity in order to avoid harmful interference to the primary service.

Conversely, GSO systems operating on a secondary basis also may resort to the same satellite/frequency diversity techniques when operating in a band with a primary designation to NGSO FSS.

Importantly, this operation enables both services, NGSO-FSS and GSO-FSS to have the advantage of blanket licensing and ubiquity even though their operation is on a secondary basis.

Thus, while satellite and frequency diversity increases operating costs, VisionStar believes that experience with satellite and frequency diversity will largely overcome these cost implications, resulting in greatly expanded allocations for ubiquitous FSS.. The operation of both NGSO and GSO FSS in the same bands greatly enhances spectrum efficiency and greatly advances the Commission's goals of service to the public.

E. PFD IN 18.55-18.8 GHZ BAND. The FCC rules specify a PFD of -101 dBW per square meter in the 18.6-18.8 GHz Band for any arrival angle for GSO-FSS systems providing service in the 18.55-18.8 GHz Band. The VisionStar space system, described in its FCC application, is expected to operate with PFDs in the range of -120 to 125 dBW per square meter in the U.S., for service to 0.7 meter subscriber antennas. VisionStar also envisions a receive-only service to earth stations as small as 0.5 meters. Consequently, VisionStar believes the proposed PFD limit is reasonable.

F. CO-PRIMARY GSO-FSS & FS SHARING IN THE 18.3-18.4 GHZ BAND. The Commission, in its NPRM, paragraph 35, proposes a primary allocation to the GSO-FSS in

the 18.3-18.55 GHz Band with both FS and NGSO-FSS as secondary. Also, the FCC, in paragraph 35 of the NPRM, is considering a modification to this proposal, adding a co-primary allocation to FS in this band, from 18.3-18.4 GHz.

For the reasons given above, VisionStar supports the proposed co-primary allocation to FS in the band from 18.3-18.4 GHz.

Further, under the VisionStar proposals, the overall allocations in the 28 and 18 GHz bands should have a 1:1 correspondence while maintaining the balanced Commission approach.

G. COORDINATION PROCEDURES. A simplified coordination procedure, consisting of simple radiation characteristics and a registration of facilities and technical characteristics so that each customer and operator is protected, eliminates the participation of the FCC and may reduce coordination costs, but does not solve the basic problem, that in the context of ubiquitous subscriber service, coordination limits the ubiquity of each service and adds to the service costs.

Coordination between satellite systems, such as NGSO-FSS and GSO-FSS, in which one is primary and the other is secondary, is fundamentally feasible because blanket licensing and service ubiquity of either service is not affected. Similarly, other secondary services must undertake, via frequency or satellite diversity, to avoid harmful interference to the primary service.

H. INTERNATIONAL FREQUENCY PLAN. VisionStar is authorized to operate only at 113 degrees west. However, VisionStar may, in the future, expand its services to other countries. VisionStar believes, therefore, that an extension of these allocations and general rules via the ITU would be of significant benefit both to U.S. companies desiring to provide service elsewhere and to the space systems of other administrations. A key consideration is the allocation of bands such that blanket licensing for both satellite and terrestrial services and service ubiquity may be encouraged. This may include actions at WARC's and similar international forums.

I. FCC GRANDFATHERING PLAN. Any grandfathering of FS can be quantified and therefore should not impede the implementation of satellite services having blanket licensing and ubiquity. It is the Commission's intentions to permit FS networks existing at the time of the NPRM to continue operating for an indefinite period. FS operators operating in these bands should provide sufficient technical information to enable coordination.

J. BLANKET LICENSING OF EARTH STATIONS.

J1. INTRODUCTION. The Commission, in paragraphs 43-54 proposes a blanket licensing procedure based on approval of earth station characteristics by type-class, by the imposition of satellite PFD limitations and by the imposition of limiting sidelobe and radiation characteristics for earth stations for GSO and NGSO FSS systems operating on a

primary or secondary basis within their respective allocations. Also included will be a description of the uplink adaptive power control operation. An operator may describe a number of different earth stations for type-classification. Each type-class of earth station may be produced in vast numbers. Hopefully, each satellite operator will propose a limited number of earth stations for type-classification so that the process will not be burdensome. A small number of type-classification types also will favor mass production.

The Commission's rules permitting the type-classification of earth stations not consistent with the rules also is permitted, allowing for services not now anticipated.

VisionStar assumes that both type-classes, those adhering to the Commission's rules and those that do not, will be subject to a notification process to the potentially affected parties, particularly to the operators operating in the adjacent orbital locations, for their review and written concurrence. This process should not be burdensome because only a few type-classes are expected per satellite operator and technical staffs will quickly become familiar with the procedures, important technical characteristics and with the interference potential. This review and concurrence process is necessary because of the wide range in satellite antenna gains in evidence in the Commission's application process, choices in availability due to rain and the possible use of unusual signals requiring high power density.

J2. LICENSING TERM. VisionStar believes that the proposed licensing term for earth station blanket licensing consistent with the underlying satellite license is reasonable and acceptable.

J3. LOCATION OF FSS EARTH STATIONS. VisionStar plans to provide satellite-based services to terrestrial broadband wireless systems, and to other terrestrial networks. These services include interconnection of subscribers served by separated terrestrial networks, provision of multimedia services such as Internet to hubs and the connection via satellite of outlying facilities/subscribers not serviceable by terrestrial systems. In order to provide this service VisionStar requires primary allocations, or co-primary or secondary allocations with other satellite services and fixed services such that blanket licensing and ubiquity can be accomplished.

VisionStar also will serve satellite-only customers, who also will require ubiquity. Commercial multimedia service must serve all of the outlying facilities of businesses, government agencies and institutions. Private multimedia service must connect widely dispersed families, friends and relatives. Only true ubiquity will serve these interests. Consequently, the mixing of FSS and FS may foster the important service goals of blanket licensing and ubiquitous service, for both FSS and FS and VisionStar urges the Commission to implement such designations in the Ka Band Plan. While an FSS or FS secondary service, requiring ubiquity, can provide the threat of interference or the discontinuance of service caused by the normal actions of the primary service operators, VisionStar believes there are examples of secondary FSS or FS allocations which, under special circumstances, enhance service to the public.

VisionStar does not object to the provision of gross numbers of earth stations installed per year or total numbers of earth stations in service provided this reporting serves a useful purpose.

K. TECHNICAL CHARACTERISTICS FOR INTRA-SERVICE SHARING. VisionStar's authorization is based on the technical characteristics of its seven beam satellite. VisionStar is aware that many others have described satellites with 40 or more beams and one applicant has a 1,000 beam satellite. This represents a wide range of uplink satellite antenna gain, which is reflected in the variations in eirp density required for earth stations. This is why the Commission's type-classification process must have a notification and concurrence method.

K1. SIDE-LOBE CHARACTERISTICS. Part 25.209 has been a fundamental requirement for the development of C and Ku Band systems these past 20 years. The extension of this characteristic to the Ka Band is fundamental to the orderly development of space systems and their coordination. VisionStar urges the Commission to make 25.209 equally applicable to the Ka Band. VisionStar knows of no reason why this characteristic cannot be adopted for the Ka Band service. Non-compliant antennas, if these serve the public interest as determined by the Commission, still may be used via the notification process.

K2. SIDELOBE CRITERIA. The Commission, in paragraph 56, has requested comments on whether the 25.209 criteria should start at 1 degree. VisionStar believes that the 2 degree satellite spacing criteria is well established and therefore, that the criteria should start at 2 degrees. Because of the use of small antennas, it should be clarified that this is the antenna gain including the mainlobe and sidelobes.

K3. UPLINK OFF-AXIS EIRP DENSITY. VisionStar has considered both the Motorola and Commission proposals to limit the off-axis eirp density of blanket-licensed earth stations. The performance is summarized in the following table indicating that VisionStar, with its seven beam satellite antenna, cannot meet the FCC's proposed off-axis limits in the vicinity of 4 degrees. Considering the variety in satellite antenna gains of Ka Band systems authorized or under consideration by the Commission, and recognizing the type-classification process including notification and concurrence, VisionStar respectfully suggests that the issue of earth station radiation characteristics may properly be resolved via the notification and concurrence process associated with blanket licensing. VisionStar also notes that off axis eirp density limitations have not been part of the Commission's rules in the C and Ku Band.

Topocentric Spacing deg.	<u>Eirp Density, dBW per square meter</u>		
	<u>VisionStar Design</u>	<u>FCC Proposal</u>	<u>Motorola Proposal</u>
1	28.0	35.0	
2	20.5	27.5	
2.2	20.4	19.4	15
4.4	12.9	11.9	10
7	6.9	13.9	
9.2	3.9	13.9	
48	-14.0	-4	
180	-28.4	-4	

K4. PFD. The Commission proposes -120 dBW/MHz averaged over 40 MHz and -118 dBW per MHz, averaged over 1 MHz. In satellite system design the PFD is determined in large part by the earth station antenna area and the availability objectives due to rain. RR28 and 25.208 specifies -105 to -115 dBW/MHz depending on the angle of arrival.

The VisionStar PFDs range from -120 - 125 dBW/MHz, for various climates within the U.S. with 0.7 meter antennas and a 99.5 percent rain objective. VisionStar believes that 0.5meter receive-only antennas also will find use in the service, requiring approximately 3 dB more power. The Commission has not explained the need for the more stringent PFD which would seem to be a substantial burden to the provision of ubiquitous service to subscribers with low cost earth stations having small antennas.

A tightening of the RR28 & 25.208 will disadvantage U.S. systems, operating under U.S. rules relative to systems of other administrations operating under ITU rules. Absent any important situation requiring further limitation to the PFD, VisionStar urges the Commission to retain 25.208 for the Ka Band GSO FSS systems and also to retain RR28.

K5. UPLINK ADAPTIVE POWER CONTROL. Uplink adaptive power control, described in NPRM paragraphs 57-59, maintains a relatively constant PFD at the satellite, generally mitigating adjacent satellite interference and simplifying satellite design. The availability objectives due to rain of various satellite operators may differ considerably, resulting in a wide range of rain attenuation to be overcome. There is no experience with uplink adaptive power control at Ka Band, therefore more experience is needed before uplink adaptive power control, as a technique, might be standardized or covered by specific rules.

Also, there is the possibility that neighboring satellites may not be in the instantaneous rain path of a satellite with uplink power control, resulting in a substantial increase in potential interference at the neighboring satellites. However, the number of such incidence is believed to be small relative to the underlying unavailability due to rain. In the event of such higher PFDs, the adjacent satellites also may use uplink adaptive power control to compensate.

The type-classification process, with notification, will quickly reveal difficulties in the operational details. Eventually, with additional experience, the Commission might devise specific technical requirements for uplink adaptive power control. The Commission has suggested that the following be listed in the type-class description: (1) the value of maximum attenuation, (2) the maximum high power or PFD limit, (3) the expected accuracy of attenuation measurement and compensation, (4) the response time of the system, including overshoot limits, and (5) uplink availability objectives and related information. The type-class procedure with notification and concurrence would seem to be important but unoffensive to satellite operators.

L. GSO-NGSO FSS SHARING. Under the proposed FCC Ka Band Plan and NPRM paragraph 55, GSO and NGSO FSS systems each will have primary allocations and in each of these primary allocations the other service will be assigned secondary status. Since both services envision ubiquitous service and blanket licensing involving large numbers of small, low cost earth stations, the proposed designations are very desirable.

The secondary service, either GSO or NGSO FSS, will need to employ satellite diversity, or frequency diversity, or other techniques, in order to avoid harmful interference to the primary service. VisionStar believes that these diversity techniques are endemic to sharing amongst NGSO systems and that these techniques also may be employed by the GSO-FSS operators having secondary status in an NGSO-FSS primary service. The result is blanket licensing for both services in each shared band, an important Commission objective in the public interest.

Uplink interference from one service to the other may or may not be significant depending on the system parameters. Generally, GSO uplinks will be high powered relative to NGSO links because of the longer range and other factors. LEO system uplinks, due to their shorter range, may not cause GSO interference depending on the characteristics of both GSO and LEO systems.

The FCC Ka Band Plan provides for these primary and secondary designations for FSS. As discussed previously, the presence of FS should be revisited in bands having blanket licensing and ubiquitous service. FSS and FS may be incompatible when it comes to ubiquitous service; however, the opportunity for each to operate in secondary status is at the secondary operators' own risk and should not be precluded.

Some sharing via diversity techniques have been investigated in other proceedings and consequently, the Commission is urged to explore rules regarding this type of sharing.

M. MSS/FL AND GSO-FSS INTER-SERVICE SHARING IN THE 29.25-29.5 GHZ BAND. The two services share the band on a no-interference-basis limiting the band use to a few gateway or similar large earth stations. Expanded use by either service (more MSS gateways or more FSS gateways) eventually will require coordination in order to limit interference.

For the same reasons given in the previous paragraphs for sharing with secondary services while still enabling ubiquitous services, VisionStar urges the Commission also to add a secondary designation in this band to GSO-FSS as well as FS. As a secondary service, GSO-FSS and FS likely would require diversity techniques in order to avoid causing interference to the primary services. However, FSS blanket licensing and ubiquitous service may be feasible in this band even as a secondary service. The proposed secondary designation for GSO-FSS and FS greatly expands the bands for ubiquitous service.

N. SHARING ISSUES IN THE 19.3-19.7 GHZ BAND. The Commission proposes co-primary allocations to MSS-FL and FS and secondary status to GSO-FSS. VisionStar believes that high spectrum utilization can be achieved if this allocation is adopted.

O. ANTENNA POINTING REQUIREMENTS. Antenna pointing requirements are discussed in the NPRM, paragraphs 61 and 62. BSS operators are believed to install antennas in the range of 46 to 120 centimeters within the 0.5dB points, per axis, by signal amplitude indications and simple antenna alignment procedures. This pointing accuracy, with properly instrumented antennas and trained technicians, might suffice for the FSS, resulting in a maximum pointing error of approximately 0.3degrees for a 70centimeter antenna at 19 GHz. VisionStar believes this method must be improved for operation at Ka Band because of the 2degree satellite spacing, but has not yet completed its discussions with potential earth station manufacturers. For example, non-co-channel telemetry carriers or similar pilots on adjacent satellites might be used to more accurately align the antenna along the orbital arc. These measurements improve accuracy because they appear on the slope of the antenna response. Alternatively, orthogonal polarization for antennas that are symmetrical along the orbital arc provides a sharp null with correct pointing. Obviously, these methods have limitations and may not be universally applicable.

The requirements for type-classification should include complete descriptions of the alignment method, accuracy, controls and jigs and technician training.

The transmissions of each subscriber are identifiable by the operator so that improperly aligned antennas can be identified, located and corrected via cooperation amongst the satellite operators. This provision also should be part of the type-qualification information.

P.SHARED BAND 18.55-18.8 GHZ. This band is proposed to be co-primary with the GSO-FSS and FS with NGSO-FSS as secondary as discussed in the NPRM in paragraphs 64 and 65. There appears to be no uplink allocation for this band except as a secondary designation in the 27.5-28.35 GHz band.

Q. BAND 18.3-18.55 GHZ. The proposed Band Plan allocates this band on a primary basis to GSO-FSS with a secondary allocation to NGSO FSS and FS. For the reasons cited previously, the NGSO secondary status is entirely compatible with the development of ubiquitous service so that both GSO and NGSO FSS operators may establish ubiquitous service in this band, with the NGSO-FSS as secondary. VisionStar urges the Commission to include the secondary designation of FS in this band consistent with previous comments.

R. NGSO-FSS SHARING ISSUES. In NPRM paragraphs 66 to 69 the Commission makes reference to a Teledesic proposal to conduct sharing studies over the whole Ka Band before any operator would be permitted to move forward.

VisionStar urges the Commission to consider this proposition as serving the public interest however, not at the risk of delaying the earliest possible deployment of these services. The small business “Early Service” approach may be a way to avoid this potential delay. While JWG-18 already has demonstrated an inability to reach accord over FSS-FS , there is a need to revisit this issue.

S. NGSO-NGSO SHARING ISSUES. The Commission has requested comments on sharing issues in the NGSO FSS bands. VisionStar plans to provide multimedia service only by a GSO-FSS space system. VisionStar, currently, has no plans to implement an NGSO system. However, VisionStar has proposed sharing techniques such as satellite and frequency diversity as means for obtaining greater spectrum utilization with compatible services in the same band, such as GSO-FSS primary and NGSO-FSS and FS secondary, and vice versa, leading to three co-existing ubiquitous services in the same band. These techniques are the very ones which have been advanced by various parties in order to accomplish sharing amongst various FS and NGSO systems, both LEO and MEO.

VisionStar suggests that satellite diversity is, in fact, similar to the 2 degree sharing plan that has been developed by the Commission for the GSO FSS in the C, Ku and now, the Ka Band. The difference is that the coordination angle appears in two dimensions instead of one dimension along the GSO. With satellite diversity, a GSO earth station (secondary designation) that is required to avoid interference with an NGSO satellite approaching its beam path must shift its communication from one satellite to another (or change its frequency). The technical characteristics that trigger these reactions are the same ones used for GSO-FSS coordination, namely, the sidelobe characteristics of the earth station antenna and the relative signal densities of the desired and interfering signals at the respective receivers.

Satellite diversity requires a dynamic reaction to interference threats because of the movement of the NGSO satellites. The GSO earth station must compute the ephemeris of each possible interfering NGSO satellite. An NGSO earth station in a satellite diversity mode also must be informed of the particular satellite to which it must transfer its traffic. An NGSO satellite must also be informed of its succeeding (rising) satellite.

Frequency diversity operates with the same dynamics except a new frequency is selected instead of an alternative satellite. For example, the frequency may be changed from one having secondary status to one having primary status.

The rules for space and frequency diversity for primary or secondary users have yet to be worked out. Specific rules, as required, may be developed by the Commission as these coordinations proceed and the FCC participates in them or monitors the results.

T. INTERNATIONAL COORDINATION. The NPRM in paragraphs 70 to 71 requests comments on the need for international coordination for FSS earth stations near the borders. The proposed coordination, invoked within 16 kilometers of the border with a horizontal, maximum PFD at the border for both FSS and FS systems, is a reasonable approach. This failing, a coordination between the affected parties may result in a solution.

U. TIMING ISSUES (for inter-service sharing). The Commission, in NPRM paragraph 72, solicits comments on allocations and rules pertaining to the bands 19.7-20.2, 28.35-28.6 and 29.5-30.0 GHz, allocated to the GSO FSS on a primary basis. These bands are already allocated to authorized space systems in the so-called "first round". Many of these systems are already under construction and in coordination via the ITU. Consequently, it is imperative that blanket licensing of GSO FSS earth stations be instituted by the Commission at the earliest time so that the subject earth stations may be designed and mass produced.

Blanket licensing of other bands also should proceed at the earliest time; however, it is important, in the public interest of receiving service at the earliest possible time, that one band and one service should not be held hostage to progress in another band and service. In particular, the GSO-FSS has been providing service for over two decades, with many instances of blanket licensing such as for Qualcomm's mobile service, Sky Radio's broadcast service, VSATs and BSS. The GSO-BSS also has been providing ubiquitous service via earth stations that are blanket licensed. The GSO-FSS is merely an extension of these earlier services, with similar rules, and there is no reason to delay the service due to the licensing of NGSO systems or other systems or services.

V. BSS ALLOCATION. The Commission's NPRM, paragraphs 73 to 82, refers to the allocation of new frequency bands, 17/25 GHz, to BSS based on a request submitted by DirecTV and supported by Hughes, Lockheed Martin and Space Systems Loral. VisionStar lends its support to this initiative and urges the Commission to proceed forthwith with the allocations and service rules. The Commission has stated that the BSS will be the subject of a new NPRM to be issued soon.

VisionStar observes that BSS is expected to be an integral part of the multimedia service along with FSS. Importantly, BSS provides point to multipoint capability for broadcasting video and various computer files and data (i.e., multicast). With enough channels BSS also may provide an effective and affordable pay-for-view service, HDTV and 3DTV. VisionStar envisions subscriber earth stations with the capability of receiving BSS signals and also interacting with Ka Band GSO-FSS systems, greatly expanding the services available to the public..

The FCC proposes, in a future NPRM and proceeding, to make this allocation and to resolve all sharing and operating issues consistent with an operational date of April 1, 2007. There is a government use of the 17 GHz band up to this date. VisionStar urges the Commission to investigate whether an earlier service, under special circumstances, might be possible, perhaps in the range of 2004 to 2005 instead of the ITU Footnote S5.517 specifying April 1, 2007 as

the date for the activation of this band. This possibility might be reviewed in the subject NPRM.

DirecTV has proposed 4.5degree spacing and the PFD limits specified in Part 25 of the Commission's rules, which will be the subject of the new NPRM.

VisionStar's system includes the possibility of both BSS and FSS for its trunking and subscriber earth stations. These earth stations are limited by the 2degree spacing requirement for FSS and achievable sidelobe characteristics such that larger antennas, 50 to 70 centimeters, are to be used. This suggests that the 4.5degree spacing, proposed by DirecTV for a BSS-only system, may not be the best choice if most subscribers, or a large number of them, have larger antennas. If the BSS can be made to operate with 2 degree spacing, through the use of polarization or frequency isolation, then there will be many more BSS channels available and each operator may provide both BSS and FSS. The satellite spacing and orbital location also may relate to the dual use of the 17 Ghz band, making the co-location of the two BSS satellite types not desirable.

VisionStar urges the Commission to proceed with its NPRM for the BSS at the earliest time so that these matters may be fully reviewed.